



## Model 730 FSEA Full Stream Elemental Analyzer



The ETI Model 730 Full Stream Analyzer is an Online Bulk Material Analyzer using prompt-gamma neutron activation analysis (PGNAA) and a Single-Gamma Density Gauge to determine the elemental composition of material as it passes through the device's analysis zone on a conveyor belt.

The FSEA uses no-contact non-destructive PGNAA technology to measure the elemental content of 100% of the material in real time while it is in motion on the conveyor. The device provides analytical data to operators and plant control systems on a minute-by-minute basis.

The analyzer's real-time measurement and reporting allows plant operators to react to and correct chemistry problems, enables quarry managers to build consistent stockpiles of material, and can generate reports on material quality for batches, stockpiles, or particular time periods.

Typically installed after the quarry crusher and before the Raw Mill, the FSEA allows operators to maintain tight control over cement chemistry before the raw material reaches the kiln. Analyzer data is used by automated plant systems to control additive feeders, thereby maintaining proper chemistry. The analyzer is critical in controlling the quality and consistency of the clinker product.

The FSEA calculates the phase composition proportions of Alite ( $C_3S$ ), Belite ( $C_2S$ ), Tricalcium Aluminate ( $C_3A$ ), and Tetracalcium Aluminoferrite ( $C_4AF$ ). It provides  $CaCO_3$ , Loss On Ignition (LOI), Lime Saturation Factor (LSF), Silica Ratio (SR), and Alumina Ratio (AR) values, and it directly measures and reports the analytes listed below.

- $SiO_2$
- $Al_2O_3$
- $Fe_2O_3$
- $CaO$
- $MgO$
- $SO_3$
- $K_2O$
- $Na_2O$
- $TiO_2$
- $MnO_2$
- $H_2O$
- $Cl$

Energy Technologies Inc.  
1741 Triangle Park Drive  
Maryville, TN 37801  
USA

Phone: (865) 927-9330  
Fax: (865) 927-8017

Email: [info@energytechinc.com](mailto:info@energytechinc.com)

For more information on any of our products or services please visit us on the web at [www.energytechinc.com](http://www.energytechinc.com).

## SERVICES

ETI offers an flexible service contracts for all analyzer customers. Coverage includes radiation safety surveys, leak testing, calibration of all electronics and nucleonics, cleaning, and routine software/hardware maintenance

Technical Support

Installation and Setup

Maintenance

Application Support

Hardware Support

Guaranteed Warranty

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## Design Features

### Rugged Belt Mounted Analyzer

- Assembly is dustproof and waterproof
- Assembly bolts onto existing belt structure without modification
- Minimizes installation time and cost

### Source Holder/Detector

- Gamma and Neutron sources are housed in a protective shield
- Gamma rays are collimated into a fan beam to maximize material interrogation zone (approximately 160 times that of other units)

### Auto-Standardization

- Automatic software compensation for electronic drift, source decay, and temperature variations performed every three seconds
- Ensures system precision and accuracy

### Detector Temperature Control

- Eliminates drift due to ambient temperature variations
- Ensures system precision and accuracy

### Advanced Data Acquisition and Control

- Intuitive and easy to use operator interface
- Graphical Displays
- Automatic Report Generation
- Automated Calibration
- Manual and Automatic control of process control devices (sort gate, feeder, etc.)
- Analog outputs for connection to other process equipment
- Digital outputs for alarm or sort control

## Technical Specifications

### Performance

Accuracy ..... 0.3-1.0 wt. % (typ) for washed or raw materials  
Response Time ..... 60 seconds (typ)

### Operational Material

Material Top Size ..... 24-60 in (600-1525 mm) (typ), inclination same as belt limitation  
Material Depth ..... 4-16 in (100-406 mm) depending on material density

### System Inputs

Belt Running ..... A pair of voltage free contacts indicating that the belt is running

### System Outputs

Analog ..... Eight (8) isolated 0-20mA or 4-20 mA analog outputs  
Digital ..... Four (4) 24 VDC digital outputs  
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### Environmental Conditions

Operating Temperature ..... Analyzer: -22° -122°F (-30-50°C)  
Enclosure: 40°-120°F (5-40°C)  
Humidity ..... Analyzer: 0-100%  
Enclosure: 0-90%, non-condensing  
Environment ..... Class II, Div.1 group F (G optionally available). All units are protected against dust and moisture (NEMA 4).

### Electrical Requirements

Power Requirement ..... 120/240 VAC, 50/60 Hz, 3 KVA

### Radiation Levels

Surface ..... 1.0 mREM/hr maximum radiation dose rate at all points on the surface of the equipment except in the direct beam.  
Vicinity ..... Less than 0.1 mREM/hr maximum radiation rate at all points outside 3 ft. of the source housing.

### Shipping Weight

Weight ..... 14,300 lbs (6,500 kg)